LPT/COM tester

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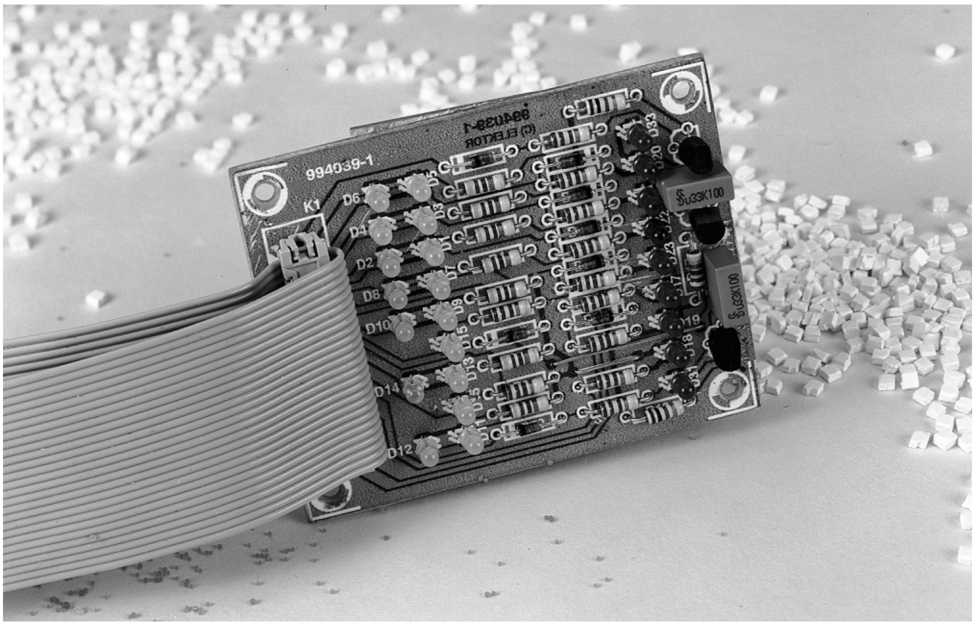


Any computer owner/enthusiast who likes to experiment should really have an interface tester. This need not be an expensive, proprietary instrument: in most cases a simple Go/NoGo tester as shown in Figure 1 is perfectly adequate. The circuit may be used for testing the level on serial interface lines (COM) as well as on parallel ones (LPT). As a reminder: parallel interfaces normally work with TTL levels (0–5 V), whereas serial interfaces usually work with levels of ±12 V to ±15 V (although interfaces used with laptop and palmtop computers invariably use TTL levels). For both cases a common 26-pin box header with protective shoulder and polarity and positioning lug. The link to the computer is via 25-core flatcable with pressed-on sub-D connectors. Note that pin 26 of the box header is not connected. If the COM interface on the computer has a 9-pin connector, a suitable adaptor must be used. The interconnections between the box header and the interface connectors are shown in the table.

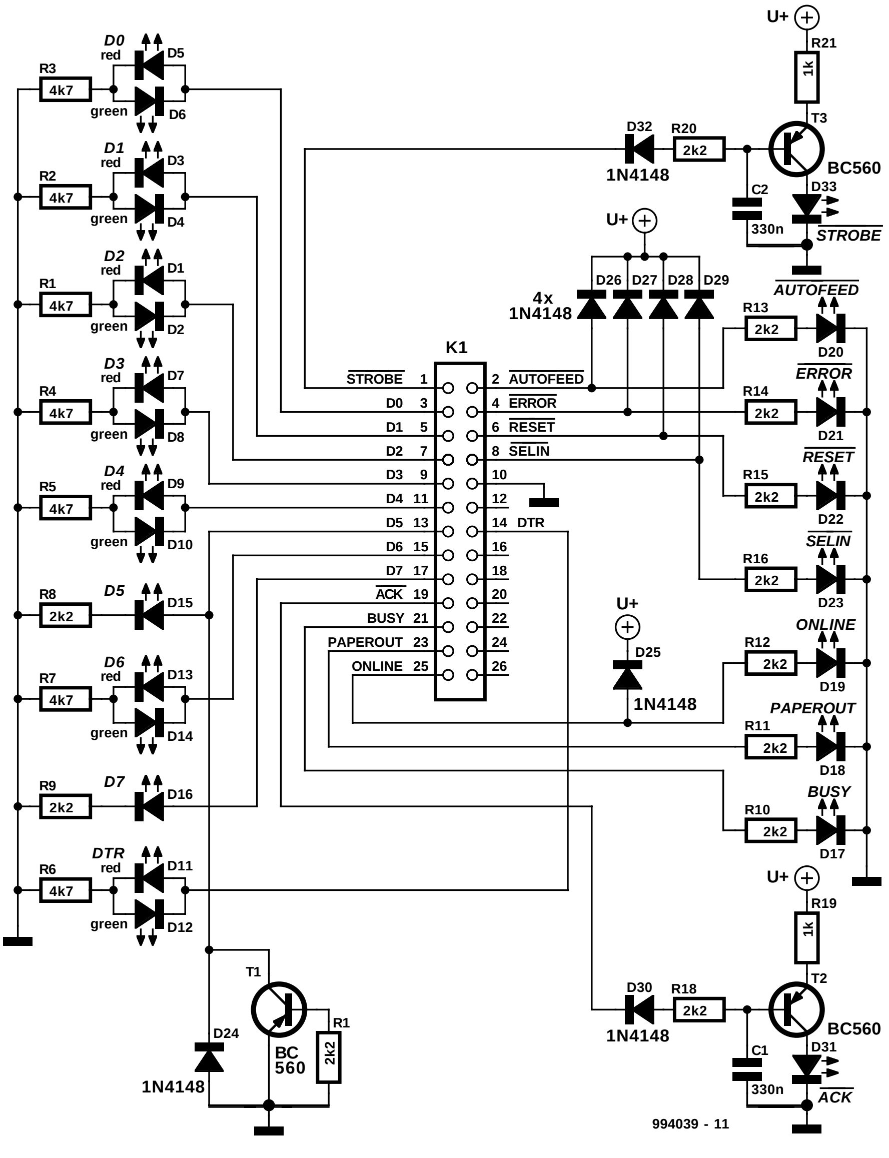
LPT DISPLAY

The display for the parallel interface consists of a red light-emitting diode (LED) and series resistor for each wire linked to earth. If the level on the wire is +5 V, the diode lights, except in the case of the $\overline{\text{ACKNOWLEDGE}}$ and $\overline{\text{STROBE}}$ lines. On these lines, the LED is connected via a inverter, T_2 and T_3 respectively, so that it lights when the line is active low. The supply voltage is derived from active low lines $\overline{\text{AUTOFEED}}$, $\overline{\text{ERROR}}$, $\overline{\text{RESET}}$, $\overline{\text{SELECT IN}}$, and $\overline{\text{ONLINE}}$, via ‘OR gates’ D_{25}–D_{29}. Network R_{18}-C_1 (R_{20}-C_2) stretches the display time, which can be altered to individual requirements by changing the component values within certain limits.

COM DISPLAY

The level display of the serial interface uses the same LEDs as the LPT display, but, since negative voltages occur on certain lines, green LEDs are connected in antiparallel with the red LEDs where relevant.

1



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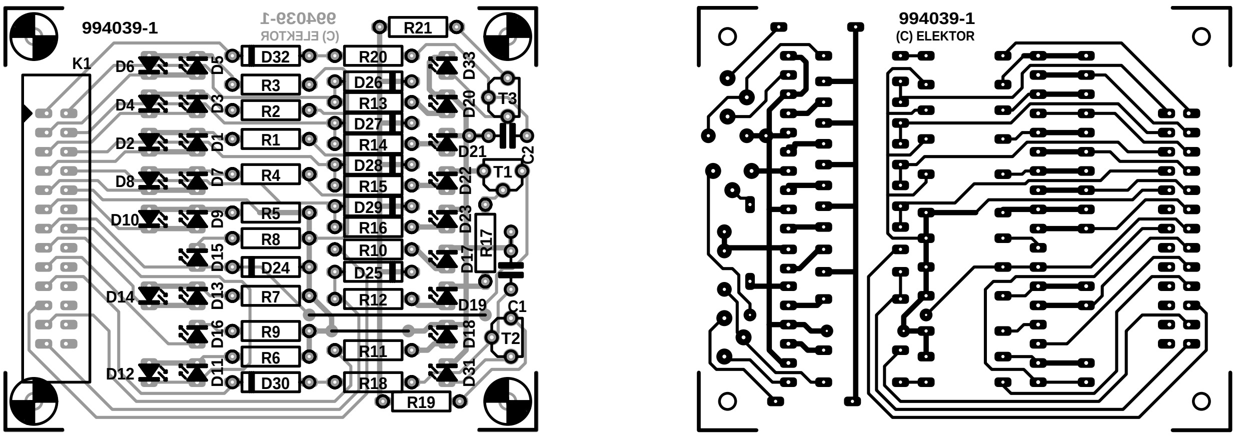

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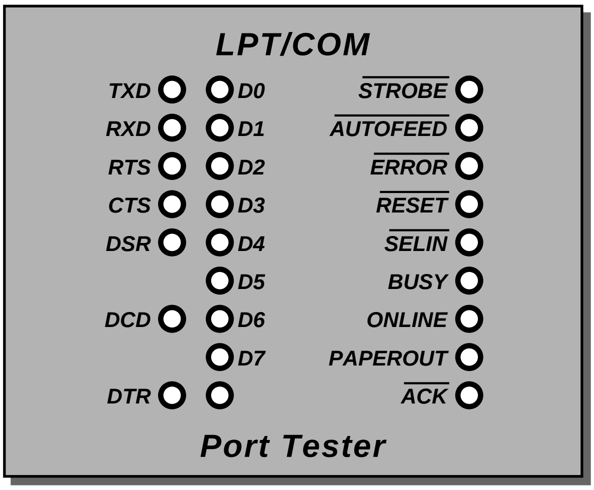

994039 - 12

Parts list

Resistors:
R_1–R_7 = 4.7 kΩ
R_8–R_{18}, R_{20} = 2.2 kΩ
R_{19}, R_{21} = 1 kΩ

Semiconductors:
D_1, D_3, D_5, D_7, D_9, D_{11}, D_{13} = LED, red
D_2, D_4, D_6, D_8, D_{10}, D_{12}, D_{14} = LED, green
D_{15}–D_{23}, D_{31}, D_{33} = LED
D_{24}–D_{30}, D_{32} = 1N4148
T_1–T_3 = BC560

Miscellaneous:
K_1 = 2×13 polarized box header
25-way sub-D male connector for cable fitting
25-way sub-D female connector for cable fitting
PCB Order no 994039-1

Additionally, there is a DTR line and transistor T_1, which is linked to the (LPT) DATA5 line. In the case of a serial interface, this line is linked to the interface earth, which is passed on as a reference potential via D_{24} when the levels are positive, and via T_1 when the levels are negative. Note that the transistor operates with reduced current amplification since otherwise the brightness of D_{15} in the LPT mode would be insufficient.

CONSTRUCTION

The tester is best built on the printed-circuit board shown in Figure 2. The construction is very simple, but do not forget the two wire bridges and m ake sure that all components, where relevant, are wired in with correct polarity. The cathodes of the LEDs are identified by a short terminal, whereas those of the other diodes are marked by a ring. To ensure that all LEDs are at the same height above the board, first fix the board to the ready drilled lod of the enclosure and only then solder the LEDs in place.

At the left adjacent to K_1 is the COM display (negative levels). In the centre is the common LPT/COM display for positive COM levels as well as LPT levels of data lines DATA0 to DATA7. At the right is the display for the LPT control levels.

The design of a suggested front panel is shown in Figure 3.

[994039]

Pinout of K_1

K_1	LPT	COM
1	$\overline{\text{STROBE}}$	
2	$\overline{\text{AUTOFEED}}$	
3	DATA 0	TxD
4	$\overline{\text{ERROR}}$	
5	DATA 1	RxD
6	$\overline{\text{RESET}}$	
7	DATA 2	RTS
8	$\overline{\text{SELECT IN}}$	
9	DATA 3	CTS
10	GND	
11	DATA 4	DSR
12		
13	DATA 5	GND
14		DTR
15	DATA 6	DCD
16		
17	DATA 7	
18		
19	$\overline{\text{ACKNOWLEDGE}}$	
20		
21	BUSY	
22		
23	PAPER OUT	
24		
25	ONLINE	
26	n.c.	